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Marine Bioacoustics: Soundtracks for the Future

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LONG-TERM GOALS

The primary goal of our project is to provide advanced undergraduates, graduate students, and postdoctoral investigators with a broad understanding of ocean acoustics as well as the techniques used to study the ecology of marine animals *in situ*. By bringing together many of the top researchers in marine bioacoustics, biological oceanography, and marine biology, we provide students with a unique opportunity to work side by side with world experts using state-of-the-art tools and technologies. A secondary goal of the project is to provide a setting for developing and testing new technologies. In this manner, it serves as a research magnet, attracting leading scientists to conduct their own research in a creative teaching and learning environment that catalyzes interactions across the various disciplines associated with Bioacoustical Oceanography.

OBJECTIVE

To provide students with a broad understanding of the acoustic techniques used to study the distribution and behavior of marine animals in the context of their physical/chemical/biological environment.

APPROACH

Through lectures, demonstrations, and field exercises, we provide students with a unique opportunity to learn and work side by side with top scientists using state-of-the-art bioacoustic tools and techniques. During winter courses, we provide students with hands-on opportunities to investigate active acoustic methods for studying aspects of zooplankton and fish ecology and passive acoustic methods for studying humpback whale ecology. During summer courses, we provide students 1.) with a strong conceptual understanding of marine bioacoustics theory through lectures and laboratory exercises, and 2.) practical hands-on experience through field experiments and cruises.

WORK COMPLETED

During the winter course, field trials were conducted along the Kohala Coast of Hawai Island to evaluate the use of Wave Gliders deployed with hydrophones to localize and track vocalizing humpback whales.

During the summer course, we conducted a multi-frequency acoustic survey of Saanich Inlet, BC Canada and used a MOCNESS for groundtruthing the acoustics. We also tracked the real-time, 3-dimensional movment patterns of dock shrimp (*Pandulas danae*) carrying acoustic tags.

RESULTS

One of the highlights of student experiences to date includes the successful demonstration that individual humpback whales can be localized and tracked with hydrophone array deployed on Wave Gliders. Paper from this project will be presented at the 20th Biennial Conference on the Biology of Marine Mammals in New Zealandand then prepared for publication.

IMPACT

Students from around the world come to these courses because they provide the best training available in Marine Bioacoustics. The student participants from this year bring our total number of students since 1993 up to 297 students from 32 different countries. Alumni from our courses have become national and international leaders in the fields of Marine Bioacoustics and Bioacoustical Oceanography, and we are now training the second generation of students in this field (training the students of our former students).

RELATED PROJECTS

None